



Qualifying EMCA Analysis of Social Interaction through Big Data Video Analytics – an explorative study.

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Qualifying EMCA Analysis of Social Interaction through Big Data Video Analytics – an explorative study.

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Points of interest:

- Customers' physical behaviour patterns
- Customer-staff-interaction
- Interactions with material surroundings

Overall aim of the case:

Improving the customer experience and conversion rates in a Danish optican chain's stores

Video ethnographic data collection

Data: 700 hours of video recordings from 11 Danish opticians with both handheld and mounted cameras.

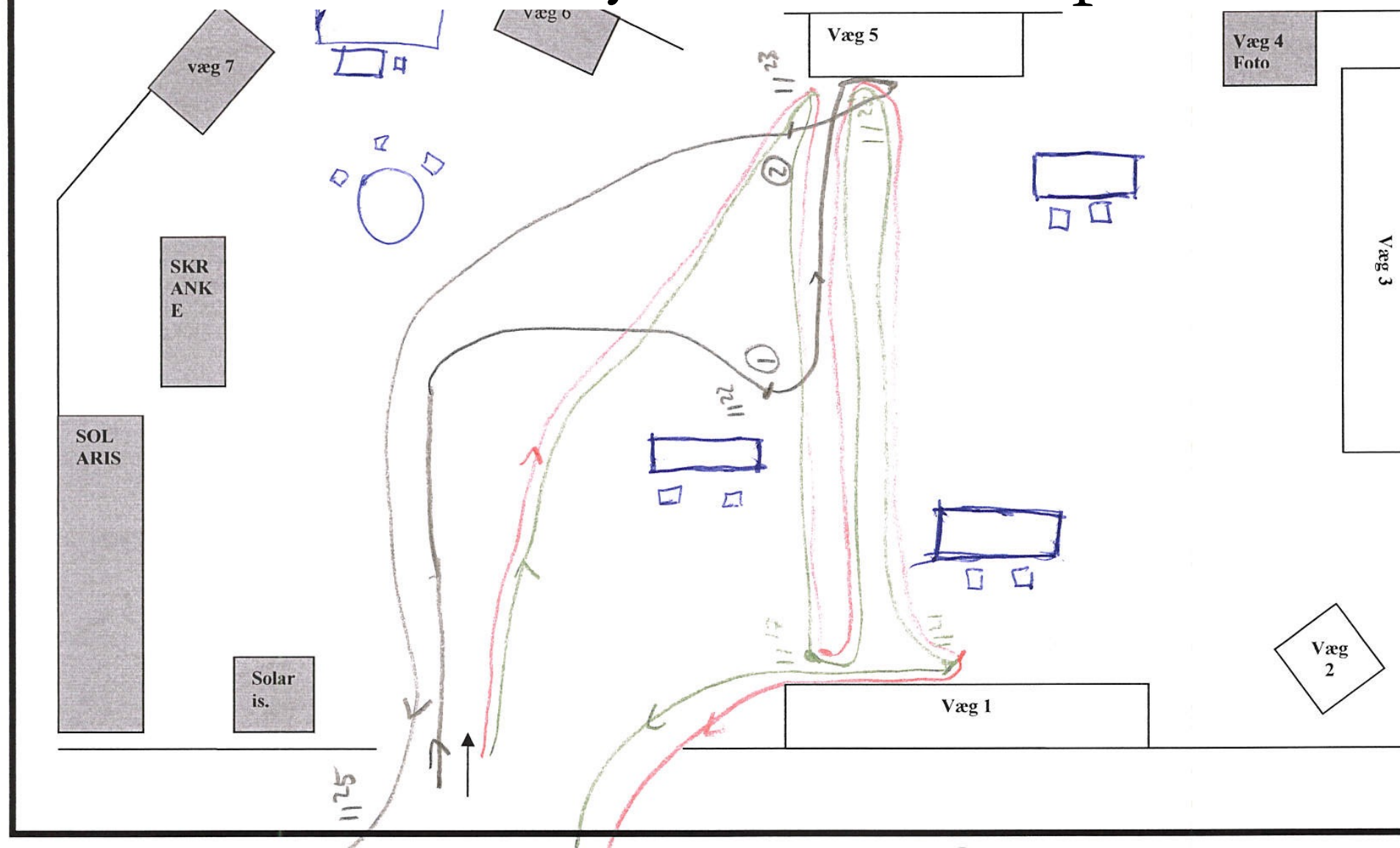


Context: Understanding the customer journey

- Approx. one month of observations
- Shadowing
- Mystery shopping
- Contextual inquiries
- Interviews
- Focus groups

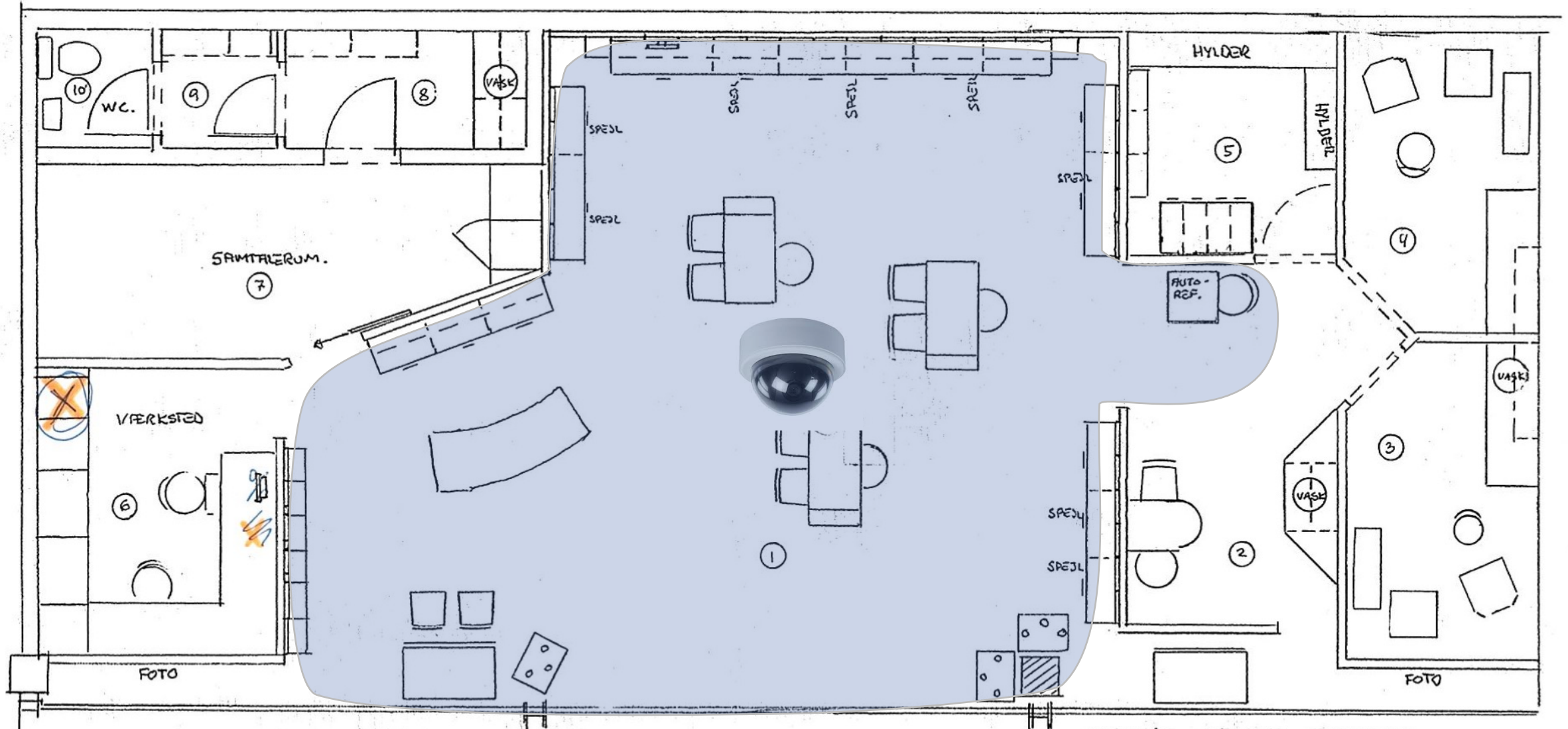


Analysis of traffic paths



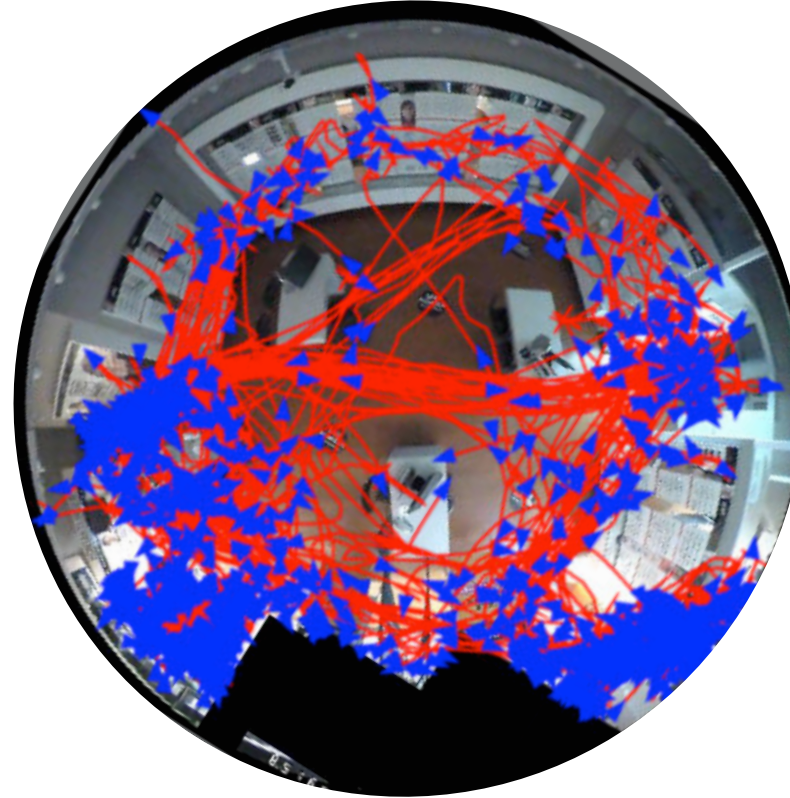
- ① MØDE MED ANSAT (BRILLER RETTES)
- ② ANSAT KOMMER TILBAGE MED BRILLER, KUNDE SER PÅ UDVALG I NEDEN

A video analytics setup with a fisheye camera





The video analytics setup



1 hour of data

39	1302967	33931	2016-06-27 15:08:06	803	0.717518	0.229909	0.820000	0.340000	0.7687590	0.6833839
40	1302968	33931	2016-06-27 15:08:07	104	0.717494	0.229991	0.824884	0.337824	0.7711890	0.6845472
41	1302969	33932	2016-06-27 15:08:48	726	0.302500	0.236667	0.312500	0.250000	0.3075000	0.7296294
42	1302970	33932	2016-06-27 15:08:49	314	0.299956	0.218628	0.329306	0.260000	0.3146310	0.7340956
43	1302971	33932	2016-06-27 15:08:50	404	0.299946	0.198628	0.388756	0.266667	0.3443510	0.7415028
44	1302972	33932	2016-06-27 15:08:50	915	0.360000	0.198844	0.435000	0.267822	0.3975000	0.7407411
45	1302973	33932	2016-06-27 15:08:51	105	0.377942	0.198224	0.435000	0.266667	0.4064710	0.7417272
46	1302974	33932	2016-06-27 15:08:51	854	0.422830	0.192167	0.475000	0.272263	0.4489150	0.7419833
47	1302975	33932	2016-06-27 15:08:52	297	0.464140	0.177075	0.515000	0.266667	0.4895700	0.7534767
48	1302976	33932	2016-06-27 15:08:52	813	0.495994	0.133627	0.545000	0.260000	0.5204970	0.7813183
49	1302977	33932	2016-06-27 15:08:53	89	0.514975	0.135669	0.580000	0.260000	0.5474875	0.7801839
50	1302978	33932	2016-06-27 15:08:53	605	0.540897	0.138013	0.609493	0.266667	0.5751950	0.7751778
51	1302979	33932	2016-06-27 15:08:53	806	0.547303	0.141568	0.617041	0.266667	0.5821720	0.7732028
52	1302980	33932	2016-06-27 15:08:54	294	0.584995	0.156863	0.655000	0.266667	0.6199975	0.7647056
53	1302981	33932	2016-06-27 15:08:54	798	0.607585	0.157581	0.682999	0.260000	0.6452920	0.7680106
54	1302982	33932	2016-06-27 15:08:54	897	0.617685	0.156764	0.685000	0.260000	0.6513425	0.7684644
55	1302983	33932	2016-06-27 15:08:55	400	0.629759	0.156294	0.700000	0.266667	0.6648795	0.7650217
56	1302984	33932	2016-06-27 15:08:57	2	0.649080	0.162378	0.710000	0.266667	0.6795400	0.7616417
57	1302985	33932	2016-06-27 15:08:57	120	0.638713	0.154957	0.708640	0.265011	0.6736765	0.7666844
58	1302986	33932	2016-06-27 15:08:57	825	0.641977	0.150164	0.705000	0.253783	0.6734885	0.7755850
59	1302987	33932	2016-06-27 15:08:58	326	0.642288	0.154729	0.710000	0.250710	0.6761440	0.7747561
60	1302988	33932	2016-06-27 15:08:58	895	0.646941	0.155704	0.708973	0.233333	0.6779570	0.7838683
61	1302989	33932	2016-06-27 15:08:59	406	0.647465	0.155722	0.710000	0.225288	0.6787325	0.7883278
62	1302990	33932	2016-06-27 15:09:00	296	0.649206	0.153333	0.710000	0.212794	0.6796030	0.7965961
63	1302991	33932	2016-06-27 15:09:01	400	0.647482	0.155707	0.710000	0.220000	0.6787410	0.7912739
64	1302992	33932	2016-06-27 15:09:01	910	0.647335	0.156297	0.709583	0.225422	0.6784590	0.7879339
65	1302993	33933	2016-06-27 15:08:50	205	0.300225	0.197689	0.400000	0.266667	0.3501125	0.7420244
66	1302994	33933	2016-06-27 15:08:51	19	0.301116	0.203899	0.344142	0.265265	0.3226290	0.7393533

Data on an individual customers' traffic paths

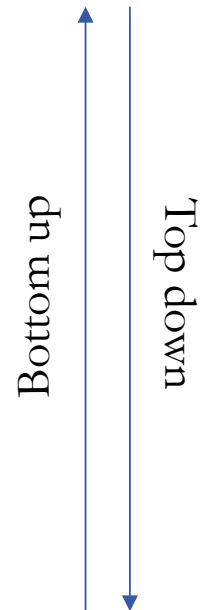
- Time stamps
- Coordinates





Aggregated interactions
and behaviour patterns

Big data / Video analytics

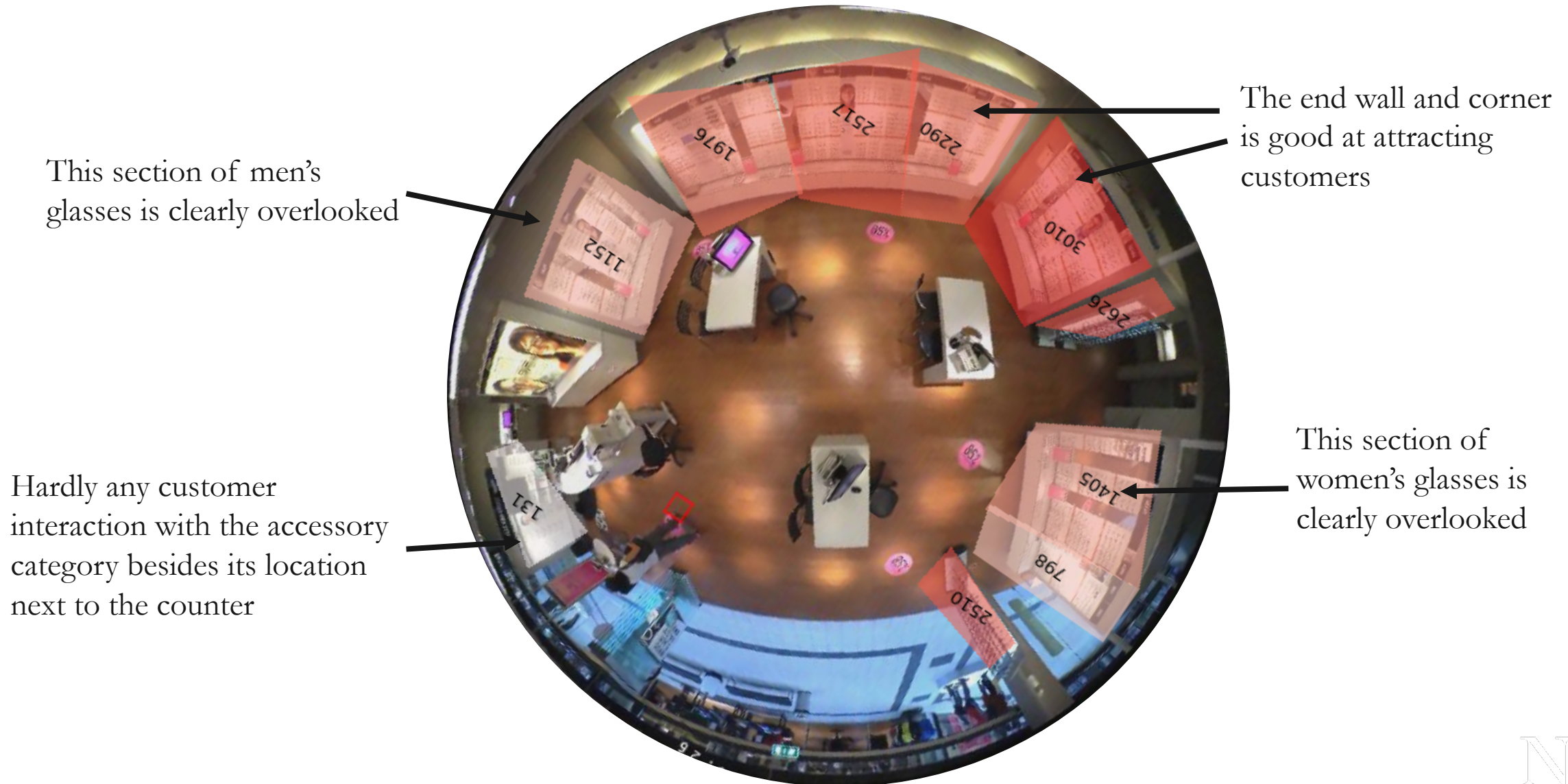


Individual interactions
and behaviour patterns

Thick data / EMCA & ethnography






































Top down: Identifying the most relevant activity at glass walls



The importance of sales table-interaction and sales charts – a bottom up example



BUDGET ENKELTSTYRKE 600,- PR. PAR 1. PAR 2. PAR 3. PAR	 Standard  Let	FLERSTYRKE 1.400,- PR. PAR 1. PAR 2. PAR 3. PAR
BASIS ENKELTSTYRKE 1.400,- PR. PAR 1. PAR 2. PAR 3. PAR	 Standard  Let  Hærdning  Antirefleks	FLERSTYRKE 2.200,- PR. PAR 1. PAR 2. PAR 3. PAR
STANDARD ENKELTSTYRKE 2.000,- PR. PAR 1. PAR 2. PAR 3. PAR	 Tynde Glas  Ekstra let  Hærdning  Antirefleks  Smuds afvisende  Blå lys brudstyrke	FLERSTYRKE 4.300,- PR. PAR 1. PAR 2. PAR 3. PAR
IMPROVED  RODENSTOCK ENKELTSTYRKE 2.500,- PR. PAR 1. PAR 2. PAR 3. PAR	 Tynde Glas  Ekstra let  Maksimal hærdning  Maksimal antirefleks  Maksimal smudsafvisende  Maksimal blålys brudstyrke	FLERSTYRKE 6.500,- PR. PAR 1. PAR 2. PAR 3. PAR
PREMIUM  RODENSTOCK ENKELTSTYRKE 3.000,- PR. PAR 1. PAR 2. PAR 3. PAR	 Tynde glas  Ekstra let  Maksimal hærdning  Maksimal antirefleks  Maksimal smudsafvisende  Maksimal blålys brudstyrke  Maksimal synaps optimering	FLERSTYRKE 7.500,- PR. PAR 1. PAR 2. PAR 3. PAR
SUPREME  RODENSTOCK ENKELTSTYRKE 3.500,- PR. PAR 1. PAR 2. PAR 3. PAR	 Ekstra tynde glas  Ultratæt  Maksimal hærdning  Maksimal antirefleks  Maksimal smudsafvisende  Maksimal blålys brudstyrke  Maksimal synaps optimering	FLERSTYRKE 8.500,- PR. PAR 1. PAR 2. PAR 3. PAR

1. OP: det man (.) #minimum vil anbefale (.)
what one (.) as a minimum will recommend (.)
**points at a specific spot----->*
 fig #fig.1
2. ved de styrker du har
with the power you have
**>----->*
3. det- det såen hvad jeg selv synes ↑ikk
that- that's what i think of it ↑right
>----->
4. (0.5)
5. der vil jeg faktisk# anbefale (.) så noget som det# her
i will actually recommend (.) something like this
cirkling at a specific spot with the pen
lifts pen
 fig #fig.2 #fig.3
6. (0.9)
7. OP: ikk øh::m (.) #hvad siger du til det?
right uh::m (.) what do you think of that?
**..... OP looks at CU----->*
+keeps looking at diagram----->
 fig #fig.4
8. (2.6)
>--OP looks at CU-->
+>--CU looks at diagram-->+
9. CU: #i mit ↑tilfælde
in my ↑case
 fig #fig.5

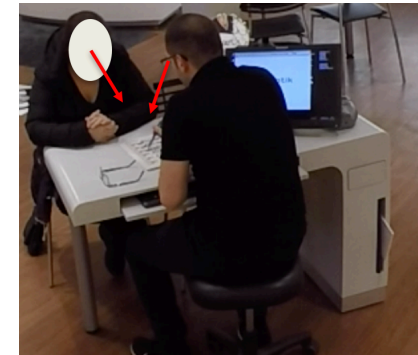


Figure 1



Figure 2

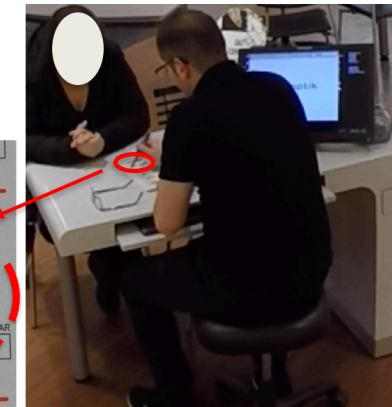


Figure 3

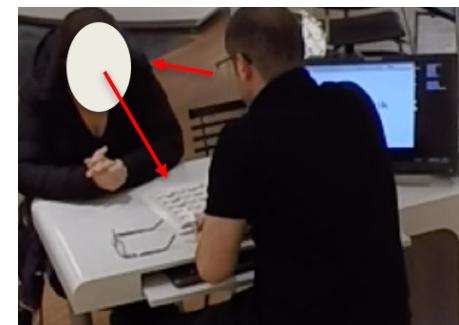


Figure 4

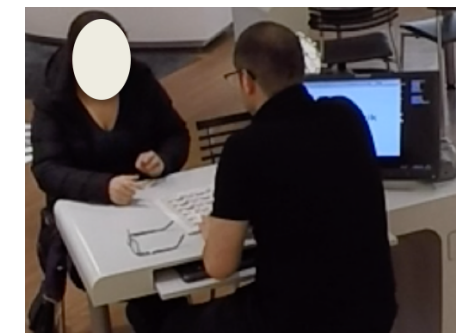
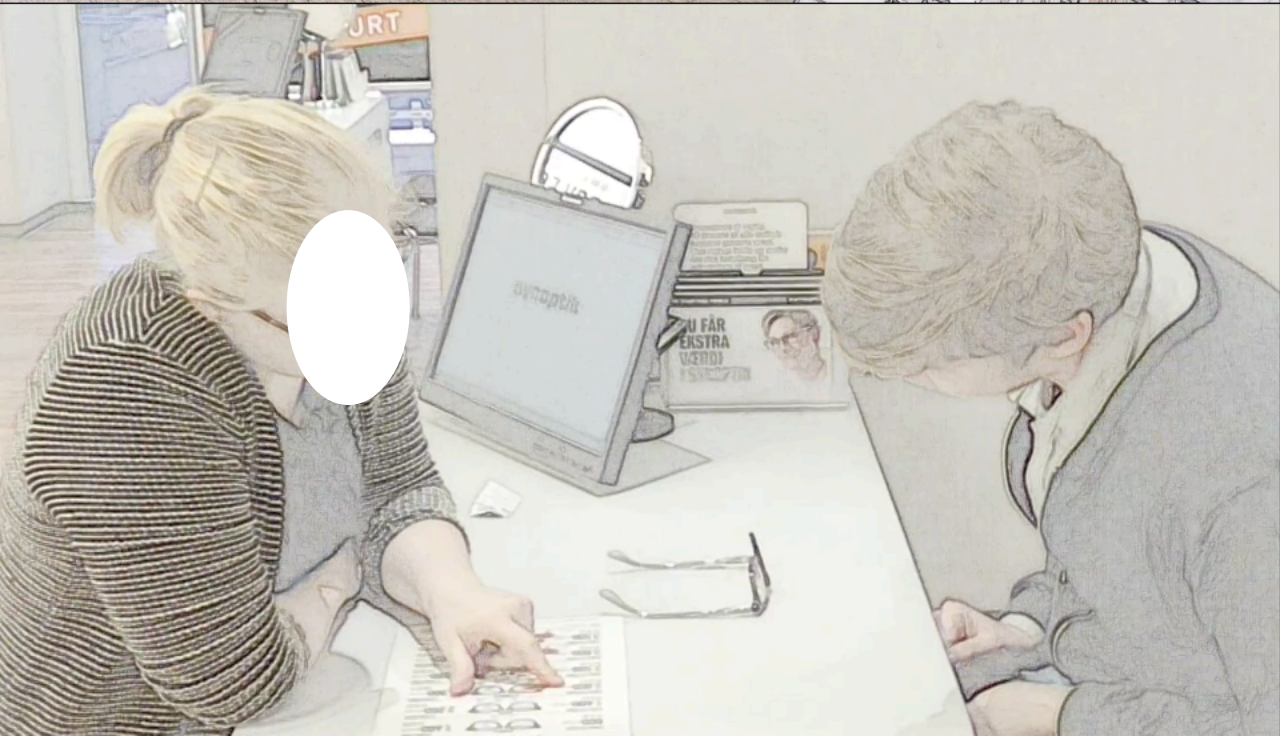


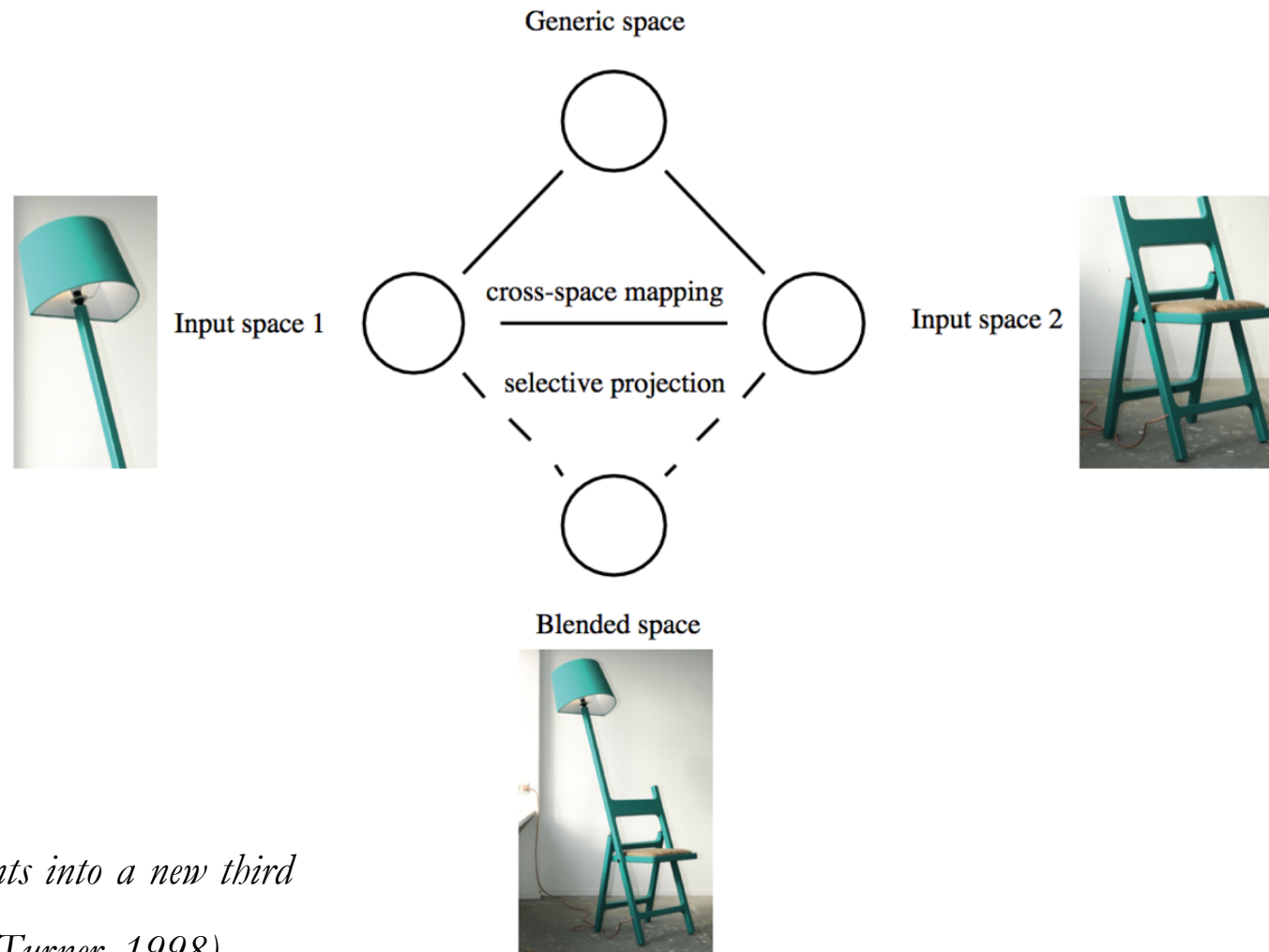
Figure 5

Our big data analysis showed that the tables were central to the customer journey and the store flow

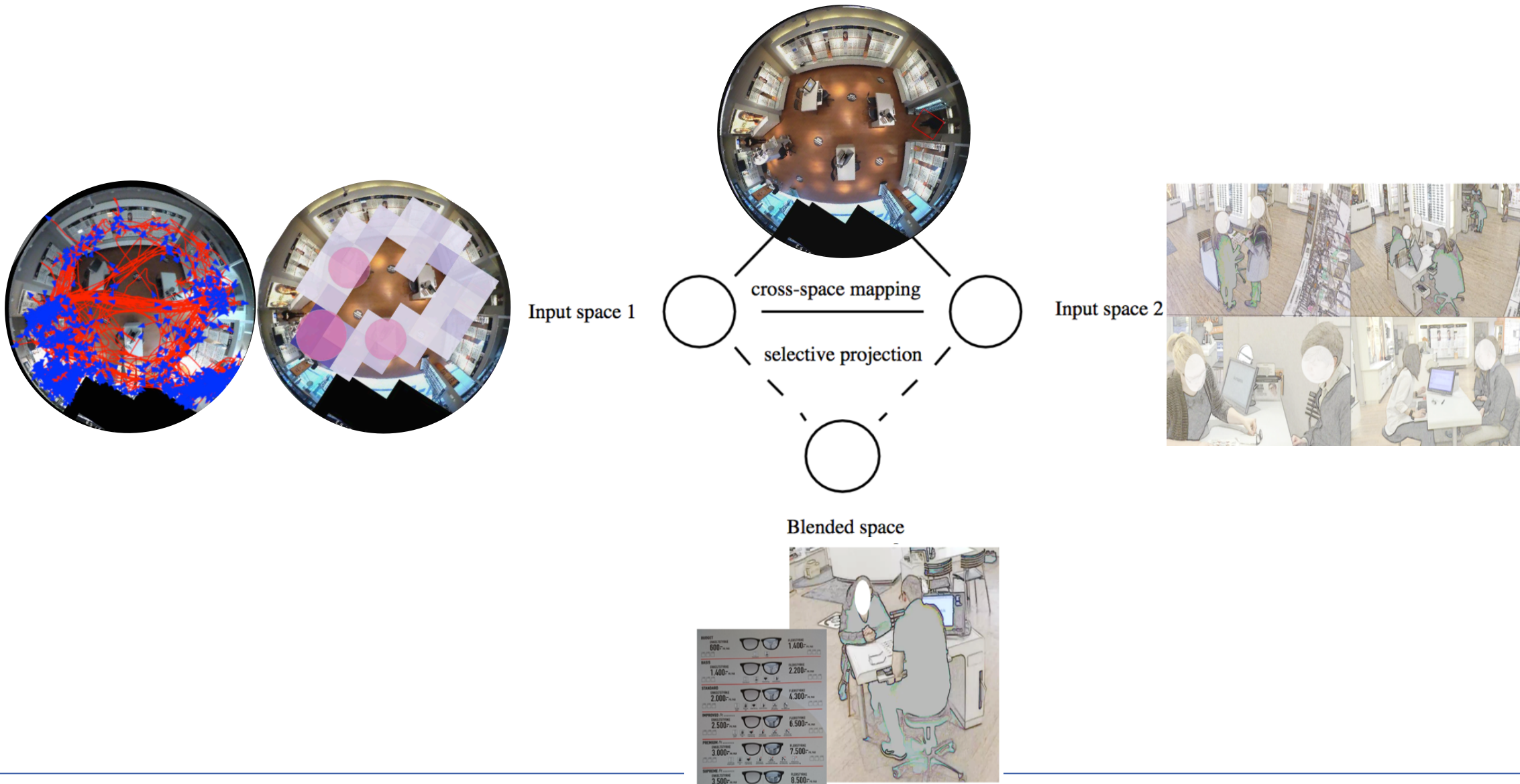




Big thick blending –
a method for mixing
analytical insights from big
and thick data sources



*The blending of different elements into a new third
(see Due, 2014; Fauconnier & Turner, 1998).*



Concluding remarks

Video analytics can help the EMCA analyst overcome the problems of:

1. Data overload (top down)
2. Generalizability of relevance of settings (bottom up)
3. Identifying “normal” or frequent interactional phenomena as well as deviant cases (top down)

In our case:

- Bottom up analysis contributed with generalizability
- Top down only generated few surprising findings, mainly due to:
 - The timing of the big data analysis
 - The optician store as a setting

When could video analytics successfully be used for EMCA research purposes?

- Large places (e.g. airport, mall, museum, arcade)
- High "traffic" areas
- Good line of sight, i.e. few visual obstacles
- It should be used exploratively
- Should be combined with video ethnography, as video analytics will only analyze paths and will not generate any explanations.



A final note on legal and ethical issues

- Video analytics cannot practically be used with individual consent – it is only possible if we accept a scientific privilege.
- Data sheets can be saved and used for analysis without restriction – but what about the video recordings?
- Video analytics can be combined with other data sources, e.g. Wi-Fi triangulation of smartphones, thus making the otherwise anonymized data personally identifiable.

References

- Bornakke T and Due, B (forth.): Big–Thick Blending: A method for mixing analytical insights from big and thick data sources
- Due, B. L. (forth.). Diagrammatology in the wild. Explaining and selling while using inscribed objects at the optician. *Journal of Applied Linguistics and Professional Practices*.
- Fauconnier G and Turner M (1998) Conceptual integration networks. *Cognitive science* 22(2): 133–187.

Thank you

